```
//Matematica.h

#pragma once

int modulo(int a, int b);
int mcd(int a, int b);
int inverso(int a, int b);

//Matematica.cpp

#include <iostream>
#include "Matematica.h"

using namespace std;

int modulo(int a, int b) {
	int r = (-1 * ((a / b) * b) + a);
	if (r < 0) {
		r += b;
	}
	return r;
}

int mcd(int a, int b) {
	int a2 = a, b2 = b;

	int r = modulo(a, b);

	while (r != 0) {
		int q = a / b;
		r = modulo(a, b);
		a = b;
		b = r;
	}

	return a;
}

int inverso(int a, int b) {

	int r1 = a, r2 = b;
	int s1 = 1, s2 = 0;
	int t1 = 0, t2 = 1;
	int r, s, t;

	while (r2 > 0) {
		int q = r1 / r2;

		r = r1 - (q * r2);
		r1 = r2;
		r2 = r;

		s = s1 - (q * s2);
		s1 = s2;
		s2 = s;

		t = t1 - (q * t2);
		t1 = t2;
```

```
			t2 = t;

		}


		return modulo(s1,b);

}
```

```
//Afin.h

#pragma once
#include <string>
#include "Matematica.h"

using namespace std;

class Afin {
public:
		Afin(string a);
		string cifrar(string m);
		string descifrar(string m);
		string alfabeto;
private:
		int claveA, claveB;
};
```

```
//Afin.cpp

#include <iostream>
#include "Afin.h"
#include <random>
#include <time.h>
#include "Matematica.h"

using namespace std;


Afin::Afin(string a) {
		srand(time(NULL));
		alfabeto = a;
		claveA = rand() % 26;
		while (mcd(claveA, alfabeto.length()) != 1) {
			claveA--;
		}
		claveB = modulo(rand(), alfabeto.length());
}

string Afin::cifrar(string m) {
		string cifrado;
		for (int i = 0; i < m.length(); i++) {
			int pos = alfabeto.find(m[i]);
			int pos2 = (claveA * pos) + claveB;
			int z = modulo(pos2, alfabeto.length());
			cifrado += alfabeto[z];
		}
		return cifrado;
}
```

```
string Afin::descifrar(string m) {
	int invA = inverso(claveA, alfabeto.length());
	string descifrado;
	for (int i = 0; i < m.length(); i++) {
		int pos = alfabeto.find(m[i]);
		int pos2 = invA * (pos - claveB);
		int z = modulo(pos2, alfabeto.length());
		descifrado += alfabeto[z];
	}
	return descifrado;
}

//AfinMain.cpp
#include <iostream>
#include "Afin.h"

using namespace std;

int main() {
	string alfabeto = "ABCDEFGHIJKLMNOPQRSTUVWXYZ";
	Afin a(alfabeto);
	string x = a.cifrar("THEGAME");

	cout << x << endl;
	string y = a.descifrar(x);
	cout << y << endl;
}
```